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TITLE: User interface system having programmable user interface elements

Brief Summary Text (6):

The Macintosh computer user interface employs what is referred to as a desktop metaphor for the basis of its user interface. Through use of a mouse or trackball in communication with the computer, the user can select and/or move certain conic objects on the screen of the computer to control its operation. The desktop metaphor refers to the fact that: (1) the screen of the Macintosh computer often looks somewhat like the blotter of a desktop, with a menu bar across the top of the blotter from which the user can select various control features; (2) there is a trash can icon in the lower right hand corner of the blotter which can be used to remove items from the computer; and (3) programs and documents created with the programs are represented by iconic images of pages which can be placed in iconic images of folders and arranged on the blotter for easy access and organization, like the files of a filing cabinet in an office. These icons can be arranged- on the screen in a number of different manners, such as according to their type, size and color, and the user can search for files by searching for words listed in the title bar associated with each icon, but the user cannot search for a specific iconic image itself.

Brief Summary Text (7):

Another popular portion of the Macintosh user interface is the window feature. When a user selects an icon of a floppy disk or hard disk in a certain manner, a window (a rectangular shaped box which allows the user to "see" the information stored in the drive) appears on the screen of the computer. This window typically contains a number of folder, program and document icons and other images which represent the information stored in the drive. If a user selects a folder icon in a certain manner, the folder will "open" into another window representing the information within that folder. As previously stated, document and program icons can be placed in folder icons, but not vice versa, and no icon can be placed directly on a document. Iconic images have become an important feature of many user interfaces because they can be used to represent different types of data in a form which is readily understandable to the user. Icons, however, have had little functionality associated with them because they are typically only used to represent stored information that a user can access fairly directly, i.e., by selecting the icon. But some icon-like images have had some functionality associated with them, such as the button-like images that can be created with the HyperCard software application sold by Claris Corporation of Mountain View, Calif. The HyperCard application allows users to create card-like images that can have various images and features associated with them.

Brief Summary Text (15):

A preferred embodiment of the present invention comprises a user interface system having a plurality of user interface elements for marking, finding, organizing, and processing data within documents stored in an associated computer system. Each element typically has an appearance which is uniquely related to the data or the function the element is designed to represent or perform, respectively. In their

simplest form, these elements are only used to mark data within a document. Each element, however, can also be programmed to cause the computer to perform some function in association with the marked data, such as printing the data or mailing the data to someone. A user can select particular data within a document using an element and have that data associated with the element in memory. Data marked with common elements can be found by searching for a particular representative element in memory. Users can create their own elements, program elements with their own desired functionality, and modify existing elements. Elements can also be compounded together so as to cause a combination of tasks to be performed by simply activating one element. Illustrative uses for and functionality of elements in specialized applications such as a computerized camera system, a remote control device and a portable multimedia player are also disclosed. Additionally, a method and apparatus for marking and searching for data, in systems having limited input/output capability, is also disclosed.

Drawing Description Text (11):

FIG. 6c illustrates a technique for labeling a folder of data on a display screen with one or more user interface elements.

Drawing Description Text (20):

FIG. 10b illustrates the operation of a link element and a dialog box generated by activation of the link element.

Detailed Description Text (6):

A collection of these elements is shown in FIG. 2. In the preferred embodiment of the present invention, each element has a fanciful appearance and a programmed functional characteristic that allows that element to be used to mark, find, organize and process data within documents stored within the computer 2 in a manner which is unique to the appearance of that element. It should be noted, however, that the association between the unique appearance of an element and its programmed function is not necessary, and that the elements need not have any appearance at all, i.e., aural representations could be used instead of visual representations to communicate the different types of elements to a user who may not be able to see the display screen 14.

Detailed Description Text (15):

With element bases being produced at a number of different sources, many uniquely pleasing and functional element bases and element instances could be created. For example, Project element 42 was designed to impart a leather-based, ink-stamped look, with its speckled rectangular boarder. Other interesting elements are the Rush element 44 and the Lightbulb element 46. The Rush element 44 could be singularly used to mark a computer generated document as a rush document, or it could be combined with another element, such as To Do element 40, to indicate that something that is to be done, is to be done immediately. The Lightbulb element 46 could likewise be used to decorate the appearance of a document, such as to indicate a good idea, or it could be used to indicate that something is to be remembered. It should be noted that within the context of the present invention, a "document" includes any electronically generated image for creating and editing data displayed therein, such as a page of text, a spreadsheet page, an electronic mail message screen, a video image or photo, and a folder of the type illustrated in FIG. 6c, but does not include a standard window within which typical iconic images are stored and organized, such as the program, folder and document icons mentioned in the discussion of the prior art above.

Detailed Description Text (16):

FIG. 3 also includes the Confidential element 48, which could be used to restrict access to documents. For example, when a document was marked with the confidential element, only users who entered a password would be able to read the document. Other examples of how the various elements of FIG. 3 could be utilized include: (1) documents marked with the Sent element 50 could cause the document to be

automatically dated when sent to somebody; (2) documents marked with the Received element 52 could cause the document to be automatically dated when it was received by somebody; (3) documents marked with the Internal Report element 54 could be restricted to distribution only within a company or an office; (4) documents marked with the Draft element 56 would only print with the word "draft" written across each page; and (5) documents marked with the Link element 58 could be automatically linked to another document or another element located somewhere else in the memory of the computer 2.

Detailed Description Text (23):

Element instances can also be associated with entire pages of data in a computer, as is illustrated in FIG. 6a, distinguishable portions of data on a page of data, as is illustrated in FIG. 6b, or folders containing multiple pages of data and other types of information, as is illustrated in FIG. 6c. FIG. 6a illustrates a technique whereby different pages of data on display screen 14 are marked with elements, thereby associating each page with any element marking that page. Mark element instances 96 could be placed at any position desired on page 98, but would preferably be placed on page 98 so that they would still be somewhat visible if page 98 was covered by another page at a later time, as is demonstrated by the other visible portions of Mark element instance 96 on pages behind page 98. As shown in FIG. 6a, all of the Mark element instances 96 have identical element attributes, they are all numbered "10", but could also be assigned different numbers, as desired by the user, to further distinguish each element instance.

Detailed Description Text (25):

FIG. 6c illustrates that element instances can be used to mark folders of data on a display screen. Computer 2 has an image of a folder 108 displayed within display screen 14. Folder 108 could both display data, such as the notes 110 pictured on the front of folder 108, and act as a storage for other information which relates to the marks associated with the folder 108. In FIG. 6c, folder 108 is marked with two element instances, the Twin Peaks element instance 112, which relates to the project the user is working on, and the To Do element instance 40, which indicates that certain documents within the folder 108 are marked with the To Do element instance 40. This feature of marking folders with element instances is useful because by simply marking a folder with an element instance, such as Twin Peaks instance 112, all of the documents containing the Twin Peaks instance 112 would be collected within folder 108.

Detailed Description Text (27):

As described above, the various attributes of an element can be used to find data stored in the computer 2. One technique for querying the element database of computer 2, is shown in FIG. 7a, which illustrates a folder tool for filtering through stored instances to find data that matches the query constructed by the user. By selecting the Find element 104 in the well 16 of display screen 14 and moving an instance 116 of element 104 into the display screen, the user causes a finder tool box 118 to be opened on the display screen. To find particular data, the user need only select an instance of that element from the well 16, such as Phone element instance 120, and drop the instance into one of the query boxes 122 of the finder tool box 118. The processor 6 of computer 2 would then proceed to filter through the database in its memory 8 until it had found all of the documents or pages containing the Phone instance 120, which acts as a proxy to the data stored in memory 8.

Detailed Description Text (29):

More sophisticated filter queries could also be performed by computer 2 if additional features were added to finder tool box 118, such as a term search section. The performance of this feature, however, would be highly dependent on whether the user had the ability to enter recognized text. If the computer 2 is capable of having text characters entered, such as through a keyboard, then the computer could easily search for matching sets of text characters within the data

associated to each queried element. If the user could not enter text in this fashion, the user may still be able to copy text from the display screen 14 and paste the copied text into the term search section. Of course, this would only work if the text being searched for exactly matched the text stored in the term search section. In addition, it should also be noted that the user could perform hierarchical searches through use of the finder tool box 118 illustrated in FIG. 7a by simply placing additional element instances in the remaining query boxes 122. Hence, the computer 2 would first filter through all of the data to locate data associated with Phone element instance 120, and then filter through that data to find data associated with the next element instance, etc., until all of the queried boxes 122 had been processed.

Detailed Description Text (38):

Link element 172 of FIG. 10b, which is the functionally the same as link element 58 of FIG. 2, only different in appearance, is also an active element. When an instance of link element 172 is marked on a page, link dialog box 174 appears. Link dialog box 174 will then stay visible on the display screen 14 while the user pages through the various pages of information stored in computer 2. When a desired page is located, the user then selects the "this pages" button 176 causing an instance of the link element 174 to be marked on the desired page and causing the computer 2 bounce back and display the original page on which the instance of the link element 172 was originally attached. To jump between the linked pages in the future, the user would only need to select the instance of the link element 172.

Detailed Description Text (51):

When the user has entered the attributes for the compounded instances, all of the instances but the primary instances are hidden from view until the next time the primary instance is selected, thereby allowing the user to perform more operations and store more information within the area of the display normally occupied by a single instance. In addition, when the performance of the function of a primary instance is triggered, the other instances compounded to the primary instance perform their functions as well in a hierarchical order.

Detailed Description Text (60):

As described herein, the element serves as a proxy for the marked data in a preferred embodiment. Typically this is accomplished by creating a separate data structure which serves as an index or look-up table comprising identifying information to identify the element to the system, and comprising information to identify the location in memory of the marked data. Additionally, the data structure comprises information to identify the location in memory where user entered attributes for each instance of the element have been stored. In a preferred embodiment, the information identifying the element to the system may be used to determine the system attributes of the element. Of course, if desired, any of this information may be stored along with the marked data. For example, the index or look-up structure may identify all the data marked with a given instance of an element, and the user attributes may be entered along with the data so marked. Finally, if desired, an index or look-up table need not be supplied, and the identifying information for the element may be stored in the same data structure as the marked data. Then, when a user desires to search for instances of an element, the data structure may be searched for the information identifying the element being searched for. As a further alternative, a separate data structure may be created comprising information identifying the element. Each time an instance is applied to data, the marked data can then be replicated and stored in the separate data structure along with the instance. Numerous other methods of identifying the element to the system, and of associating each instance with data marked with the instance, and system and user attributes of the element may be envisioned by those skilled in the art.

Detailed Description Text (72):

Referring to FIG. 21, a further device upon which physical switches may be used, is

shown. Illustrated is remote control device 2100, which may be, for example, a remote control device which controls any type of computerized system. For example, in one embodiment remote control device 2100 is used to control operation of a computer system having the capability of playing, recording, and storing audio data. The audio data may include messages from a voice mail system, individual voice notes, any other audio data, or may comprise textual messages such as electronic mail messages which are converted to audio data by a voice synthesizer. As shown, remote control device 2100 comprises play button 2101, stop button 2102, fast forward 2103, and rewind button 2104. Additionally, if desired, remote control device 2100 may also comprise a microphone and a record button. Also shown are buttons 2110, 2111, 2112, and 2113. Each of these buttons may be used to apply a user interface element to any of the audio documents referred to above.

Detailed Description Text (74):

If the user desires to filter through the audio documents stored in the computer system associated with remote control device 2100, the user simply pushes the lower half of one or more of buttons 2110, 2111, 2112, and 2113, as desired. Specifically, if the user wishes to filter, for example, for audio documents that have been marked with the user interface elements associated with buttons 2110 and 2112 the user simply presses the lower half of buttons 2110 and 2112. Once the lower half of any of the buttons 2110, 2111, 2112, and 2113 has been pressed, the system is in filter mode. As shown, four LED's 2115, 2116, 2117, and 2118 are disposed below the buttons 2110, 2111, 2112, and 2113, respectively, to indicate that the system is in filter mode. In the example described just above, where the system is set to filter for audio documents marked with the user interface elements associated with buttons 2110 and 2112, LED's 2115 and 2117 will be on, while LED's 2116 and 2118 will be off. While the system is in filter mode, the user can search for audio documents having the selected elements by pressing fast forward button 2103 to get to the next audio document in memory which has been associated with the user interface elements corresponding to the lit LED's, or by pressing rewind button 2104 to get to the closest previous audio document having the selected elements.

Detailed Description Text (92):

In the present invention, various types of data or software may be supplied with user interface elements pre-applied to appropriate portions. For example, an encyclopedia may mark portions of data with one or more types of elements. Thus, for example, a biography giving basic information about an individual may be marked with an element having, for example, the appearance of several persons, to indicate that information on contemporaries of the individual in related fields of endeavor may be obtained by selecting the element. Dates within the biography may contain elements having, e.g., the appearance of a calendar which, upon selection, provide information of related events occurring around the time of the date in the main text. Similarly, numerous other types of pre-supplied elements may be envisioned. Note that in addition to providing a convenient link between two portions of data, the user interface element, by its appearance, conveys to the user the type of information which will be provided upon selecting the element. Further, the pre-supplied elements may contain functionality in addition to information. For example, the supplier of a catalog may pre-supply order elements. Further, the order elements may be context sensitive with the specific functionality, and/or information provided depending upon the portion of the document with which the element is associated.